

REMARKS

Reconsideration of this application is requested.

With entry of the present amendments, the claims pending for consideration are claims 1, 7-9, 12, 15 and new claims 16 and 17.

The abstract and title have been corrected as required. The Examiner is requested to reconsider and withdraw the objections of record in view of the changes the applicants have made in this regard.

The claims, primarily claim 1, have been amended in a way which is thought to improve the definition of the applicant's invention. More specifically, claim 1 has been amended to make it clearer that the applicant's process is intended to print "on" a porous substrate rather than print to prepare a porous substrate. Basis for the amendment is found at page 1, lines 16 to 17 and lines 31 to 34 of the applicant's specification.

Additionally, claim 1 has been amended to include the features of previously presented claim 4 "wherein the ink comprises a dye, casein and a liquid medium". The basis for this can also be found at page 1, lines 33 to 34 of the applicant's disclosure. The language "the casein is applied as a composition comprising a liquid medium" has been deleted from claim 1 as redundant.

Claims 2-6 and 14 have been canceled without prejudice to their possible prosecution in a separate continuing application.

Claim 9 has also been amended in a way which is thought to clarify the claim language. Support for the amendment to claim 9 is found at page 4, lines 1-2 of the applicant's specification.

New claim 16 has been included for consideration. This claim is supported by the applicant's disclosure at page 3, lines 14-18 and is thought to be allowable on the basis of the features recited therein and also for the reasons noted with respect to the applicant's other claims.

The Examiner is respectfully requested to reconsider the several Section 103(a) rejections of the applicant's claims. These rejections are based primarily on Toyota et al. (JP 59-53565 A) with Tomioka et al. (U.S. 2003/0103121); Malhorta et al. (U.S. 5,500,668) or Adachi et al. (U.S. 2002/0158952) used as secondary references applied against selected dependent claims. However, with respect, it is submitted that the applicant's invention as defined by the claims herein is not in any sense obvious from Toyota et al. considered alone or in combination with any of the Examiner's secondary references. The applicant's position with respect to each of the Examiner's rejections is set forth more fully below.

Claims 1, 4, 9, 12 and 14 (now claims 1, 9 and 12) have been rejected as obvious over Toyoda et al. However, claim 1, from which claims 9 and 12 depend, requires, inter alia, printing on a porous substrate. Substrates, in general, may be uncoated or they can have an ink receptor layer which might be swellable (non-porous) or porous. Contrary to the Examiner's comments, Toyoda et al. do not disclose a porous substrate. In fact, Toyoda et al. do not mention anything about the nature of the substrate, porous or otherwise. This distinction over Toyoda et al. should by itself obviate the Examiner's Section 103(a) rejection. However, there is even more to support the unobviousness of the applicant's invention.

More specifically, the applicant's invention is focused on the applicant's observation that the ozone fastness of water-soluble dyes is adversely affected by the components (probably fillers, inorganic oxides, etc.) present in porous media. Such ozone fastness sensitivity is unique to porous media; the applicant did not observe this sensitivity in swellable media.

Following this observation and after much experimental investigation, the applicant found that casein, in particular, improved the ozone fastness of dyes on porous media, but only if the dye and casein were in good contact with one another.

The applicant's invention is not obvious from Toyoda et al. for at least the following reasons:

- (1) Toyoda et al., as noted above, do not disclose anything about the substrate or how it might affect any property of the print;
- (2) Toyoda et al. do not relate to the technical problem of ozone fastness. Instead, at best, it relates to light resistance. The Examiner will recognize that dealing with light resistance is completely different from ozone sensitivity as in the latter, the fading can occur in the dark and is caused not by light but by a reactive gas (see page 1, lines 4 to 15 and especially 14 to 15 of the present patent application).

It is, therefore, submitted that the applicant's claims 1, 9 and 12 (and for that matter, all of applicant's claims) differ inventively over Toyoda et al., particularly since the reference fails to note or suggest the importance of porous media over swellable media and any difference therebetween and it relates to a very different technical problem of light fastness. The experimental data provided at page 7, in Table 1 of the applicant's specification clearly shows how casein markedly improves the ozone fastness of water-soluble dyes on porous substrates. This finding is clearly unexpected and unobvious from anything disclosed or suggested by Toyoda et al.

For all of the reasons noted above, it is submitted that the applicant's claims define subject matter which is patentable over Toyoda et al. Accordingly, the Examiner's Section 103(a) rejection based on Toyoda et al. should be withdrawn.

The Examiner's secondary references do not fill in the deficiencies noted above with respect to Toyoda et al. The Examiner's isolation of the significance of casein in Tomioka et al. and Nakaya et al. is clearly based on hindsight in the light of the applicant's disclosure as there is nothing in any of the references suggestive of the applicant's use of casein in the manner claimed herein to deal with the special problems relating to ozone fastness for water-soluble dyes when ink jet printing on porous media. Certainly there is nothing in any of the references to make the selections required to reach the applicant's invention.

In Tomioka et al., the core of the invention is the use of a composition comprising charged fine particles and counter charged inks, p2 [0025]. The fine particle might be cationic p8 [0121] or anionic p13, [0176]. When cationic particles are used, they might also be used with a binder p12, [0165] which could be selected from the many possible to be casein p13, [0167]. None of the cationic particle exemplified on page 24 in compositions A-D has a binder, let alone casein, present.

Clearly the Examiner's attention to casein in Tomioka et al. is not how the person of ordinary skill would see it, particularly if faced with the problem dealt with by the applicant. On the contrary, the use of casein is a feature that the person of ordinary skill reading Tomioka et al. would have no reason to perceive as salient, important or pertinent.

The applicant's claim 1 requires an ink comprising dye and casein in contact, in contrast, in Tomioka et al. and Nakaya et al., the binder even when present and (even if arbitrarily selected to be casein) is not present along with the dye in the ink. It is present along with inorganic oxide particles to bind them and so form the porous layer.

It is also noted that Tomioka et al. print on non-porous or uncoated substrates and form a porous layer in the process of the invention itself. In contrast, the present claim prints on a preformed porous substrate.

The comments made above with respect to Tomioka et al. are equally applicable to Nakaya et al. Clearly, in the circumstances, there is nothing in Toyoda et al., Tomioka et al., and/or Nakaya et al. which is suggestive of the applicant's invention or which would motivate one to obtain this invention. In fact, even if, hypothetically speaking, Toyoda et al. and Tomioka et al. or Nakaya et al. were

combined, the result would point away from the applicant's claims in that any such combination would result in a separation of casein from the ink with the dye.

For the reasons noted above, and bearing in mind the incompatibilities in the technology of Toyoda et al. with other citations, the very different technical problems addressed by each document and the very different "core" inventions in each document, coupled with the different problem of concern to the applicant, it is submitted that the references do not, and cannot, make the applicant's invention obvious.

As of possible assistance to the Examiner, there is attached hereto **Annex 1** which diagrammatically shows how the present invention differs from Tomioka et al. and Nakaya et al. In Tomioka et al. and Nakaya et al., the binder is bound to the inorganic oxide particle in the porous layer. In this way, it is not available to contact the dye. Also, the dye is applied on the top of this inorganic oxide layer and it cannot be presumed that the dye accesses the regions where binder might be present.


In stark contract, in the present invention, an ink comprising dye and casein is applied to a preformed porous substrate. Thus, intimate contact of the dye and casein is guaranteed. Also, minimization of the contact between dye and inorganic oxide is achieved. These distinguishing features of the applicant's invention make it possible to solve the ozone fastness problem which confronted the applicant when using water-soluble dyes in ink jet printing or porous media. None of the Examiner's references relate to the problem dealt with by the applicant nor do they suggest the applicant's solution to this problem. Hence it is urged that the Examiner should withdraw the Section 103(a) rejections based on Toyoda et al. alone or when considered with Tomioka et al. or Nakaya et al.

The Examiner's other reference (Adachi et al.) applied against claim 15 does not fill in the deficiencies noted above with respect to the other references.

Favorable reconsideration with allowance is requested.

Respectfully submitted,

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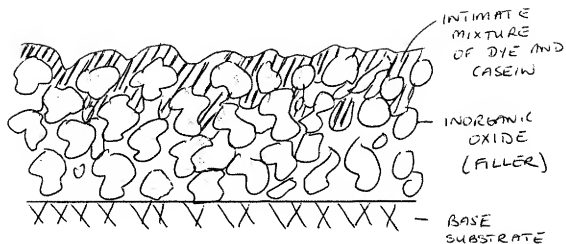
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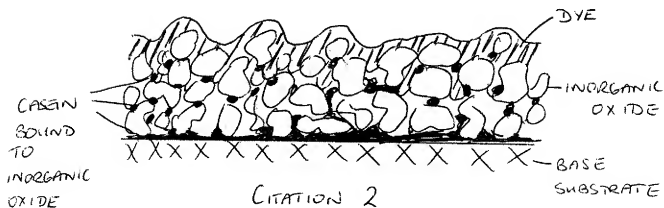
ABSTRACT OF THE DISCLOSURE

A process for printing on a porous substrate which involves ink jet printing an ink containing a dye, casein and a liquid medium onto the substrate to give a print in which the dye and casein are in contact with each other.

ANNEX 1



PRESENT INVENTION



CITATION 2

TOMIOKA ET AL

OR

NAKAYA ET AL